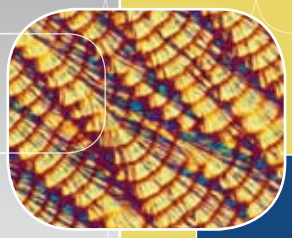

# Frontier® ACELA™

*Frontier® Acela™ High Performance Fume Hood, (vertical sash shown), Model EFA-4UDRVW-8. (Shown with EBA-4UDG-0)*

Green Product

## High Performance Fume Hood

***Laminar Topography and Perfect Protection Perimeter***

ESCO

WORLD CLASS. WORLDWIDE.

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## About Esco

Since Esco was founded in 1978 our company has earned a reputation for innovation in the worldwide laboratory equipment and cleanroom industry. Today, Esco has emerged as a market leader in containment, clean air and laboratory equipment technologies with active sales in more than 100 countries and direct company offices in the top ten geospecific markets.

From our headquarters in Singapore, Esco directs a highly efficient research, product development, manufacturing and customer service program. We are the only company in our market that is completely configured to export most of what we manufacture.

Our many languages and cultures, customs and traditions, and modern business management techniques blend into a single effort focusing on customer service, one customer at a time. As you learn more about Esco, you will understand why World Class. Worldwide. is more than a phrase. It's part of who we are, where we are from and where we are going.

## World-Class Test Facility

Esco is proud to be one of the few manufaturers in the world with a test facility capable of testing hoods to both ASHRAE 110-1995 (US) and the EN14175-3 (European) standards. Esco's Fume Hood Test Laboratory was designed with the assistance of Tintschl Engineering AG, a specialist consulting firm from Germany. It has controlled relative humidity, room temperature and pressure for optimum test conditions. Esco is also one of the few companies to routinely sample and subject production fume hoods to a battery of containment and safety tests. All custom fume hoods with modified dimensions are also tested in our laboratory to ensure containment before delivery.

## A Complete Range

Frontier Acela is the world's first high performance / low flow fume hood product range with an ergonomically angled front. Frontier Acela is available in Benchtop, Perchloric Acid, Radioisotope, Acid Digestion and Floor Mounted configurations, in a wide range of widths, with a full range of options and accessories.

## American Standard ASHRAE 110-1995

The ASHRAE 110-1995 standard is a comprehensive method for evaluating the operator safety of fume hoods by determining quantitatively and repeatably how well the fume hood contains vapors released in the workzone. First published in 1985 and extensively revised in 1995, this standard employs a set of rigorous tests to evaluate hood performance:

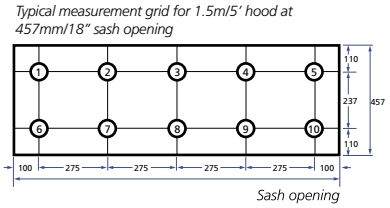
### *1. Airflow Visualization*

- Local and gross airflow visualization tests conducted to observe airflow patterns inside work chamber

| Grading | Observations |
|---|---|
| Fail | Smoke observed escaping from the hood |
| Poor | Reverse flow of smoke near opening<br>Lazy flow into opening along boundary<br>Observed potential for escape |
| Fair | Some reverse flow, not necessarily at opening<br>No visible escape |
| Good | No reverse flows<br>Active flow streams into hood around boundary |

### *2. Face Velocity Measurements*

- Face velocity and uniformity tested at 100% and design sash opening position



### *3. Tracer Gas Containment*

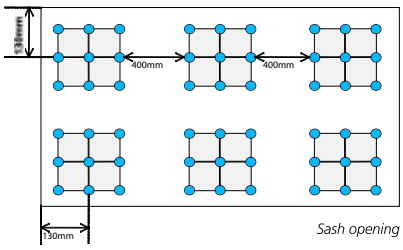
- Tracer gas containment test: SF6 released at 4L/min inside work chamber
- Consists of 3 parts
  - Static gas leak conducted at 3 positions (left, right, centre)
  - Face hood surface scan
  - Sash movement effect
- Test criteria: leakage of less than 0.05ppm as-manufactured

## European Standard EN 14175

EN 14175 is a harmonized European standard which supercedes the former national standards of Germany, the UK and France. A key element of the EN 14175, which is not present in the American ASHRAE 110 standard, is the robustness test, which simulates airflow disturbance in front of the hood.

### *1. Inner Grid Test*

- A set of 9 sampling tubes are arranged in a 3 x 3 grid, at a distance of 30 mm from the measurement plane
- Leakage will be measured at 6 different grid positions

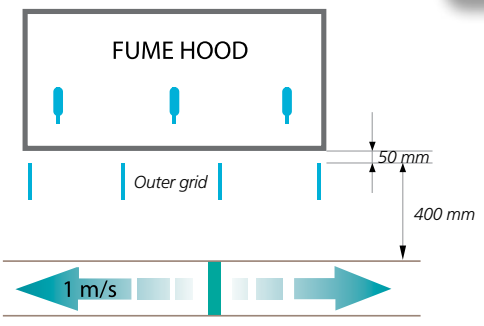


### *2. Outer Grid Test*

- Outer grid testing measures the leakage of tracer gas across the entire sash opening
- Sash is closed then opened during the test to investigate dynamic effect of sash movement

### *3. Robustness Test*

- For the robustness test, a 0.4 x 1.9 m plate crosses the front of the fume hood at 1 m/s for 6 times
- Provides an indication of the sensitivity of the fume hood towards external disturbances



## Energy Efficiency

Fume hoods — essential safety devices used in laboratory environments — are highly energy-intensive, each one consuming more energy than three homes in an average U.S. climate. Depending on climate and system design, estimated energy costs for fume hoods range up to **US$9000 annually**[1], based on face velocities of 0.5m/s (100fpm) at full sash open position for a 1.8m (72.0") hood.

Variable Air Volume (VAV) is one of the various approaches presently employed to reduce hood energy consumption. The table below compares conventional hoods, VAV hoods, and the Esco Frontier Acela High Performance Low Flow Hood.

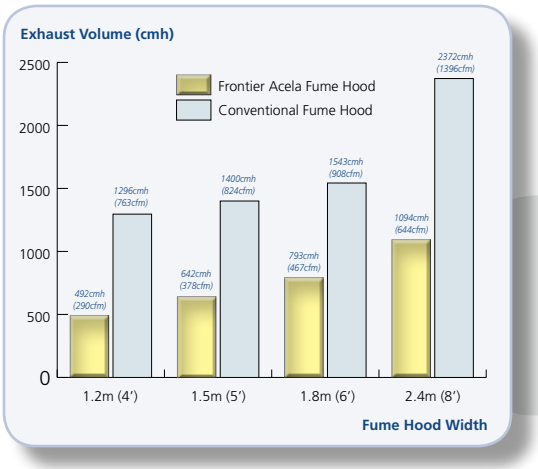
| | Conventional Fume Hood | Variable Air Volume (VAV) Fume Hood | High Performance Low Flow Fume Hood |
|---|---|---|---|
| Working Principle | 0.5 m/s (100 fpm) @ full open sash position | 0.5 m/s (100 fpm) @ all sash positions with sophisticated control system | 0.3 m/s (60 fpm) @ 457 mm (18") sash opening using advanced aerodynamic designs |
| Initial Cost | Low | High | Medium |
| Running Cost | Very High | Medium (VAV Maintenance) | Low |
| Ease of Installation, Commissioning and Maintenance | Easy | Difficult | Easy |

[1] *Energy use and savings potential for laboratory fume hoods, Evan Mills, Dale Sartor; Energy, 2003*

Green Product

Compared with conventional hoods, Esco Frontier Acela operates safely at 0.3 m/s (60 fpm) at 457 mm (18.0") or full open sash position while maintaining excellent ASHRAE and EN containment. Exhaust volume reductions of up to 62% may be achieved without compromising safety. **This translates into an annual operating cost savings of up to US$5600**. Unlike VAV systems the Esco Frontier Acela is easy and inexpensive to install, commission and maintain.

| Fume Hood Width | Exhaust Volume | | % Reduction in Exhaust Volume |
|---|---|---|---|
| | Frontier Acela 0.3 m/s (60 fpm) @ 457 mm (18") | Conventional Fume Hood 0.5 m/s (100 fpm) @ full sash open | |
| 1.2m (4') | 492 cmh (290 cfm) | 1296 cmh (763 cfm) | 62% |
| 1.5m (5') | 642 cmh (378 cfm) | 1400 cmh (824 cfm) | 54% |
| 1.8m (6') | 793 cmh (467 cfm) | 1543 cmh (908 cfm) | 49% |
| 2.4m (8') | 1094 cmh (644 cfm) | 2372 cmh (1396 cfm) | 54% |



## Benefits For All Stakeholders

### Health and Safety Authorities

- ASHRAE 110 and EN 14175 tested at face velocities down to 0.3m/s (60fpm)
- Sash-lock and creep-down mechanisms ensure operator safety
- Optional Sentinel XL Airflow Monitor

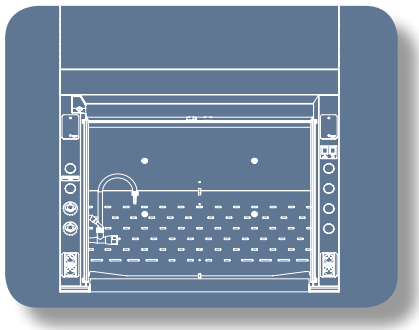
### Facility Owners

Energy Efficient

- Operates at 0.3 m/s (60 fpm) at 457 mm (18.0") operating height
- Energy savings of up to US$5600 annually for each fume hood

### Lab Personnel

- Certified safety
- Precisely-tuned aerodynamics
- High sight line
- Angled front
- Excellent ergonomics



### Lab Designers and Architects

- Neutral color scheme
- Futuristic design
- Detailed architectural specifications and drawings

### Installation and Service Personnel

- Robust tri-wall side pan construction
- Factory-fitted service fixtures are pre-plumbed
- Chain and sprocket sash
- Wide range of field-installed accessories

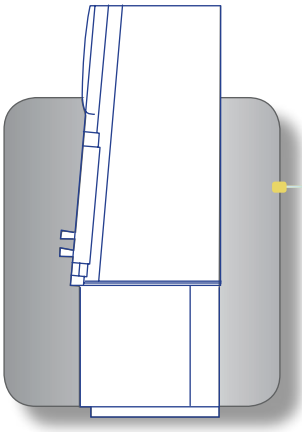
# Frontier Acela® High Performance Fume Hood
# Laminar Topography and Perfect Protection Perimeter

**Chain and Sprocket Sash Support System**

Large arbor sprockets and chain drive make sash travel quiet and effortless.

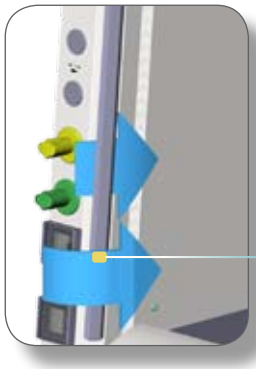
**High Sight Line**

High sight line of 1803 mm (71.0") coupled with an automatic lowering function combines safety and convenience.



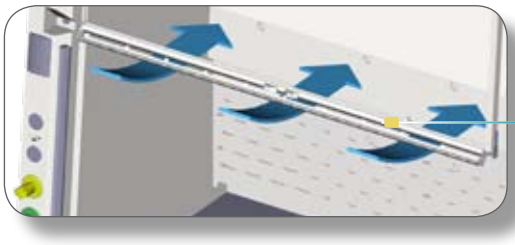
**Perfect Pitch Profile**

Ergonomics, safety and aesthetics all come together with the 5° pitch of the face.



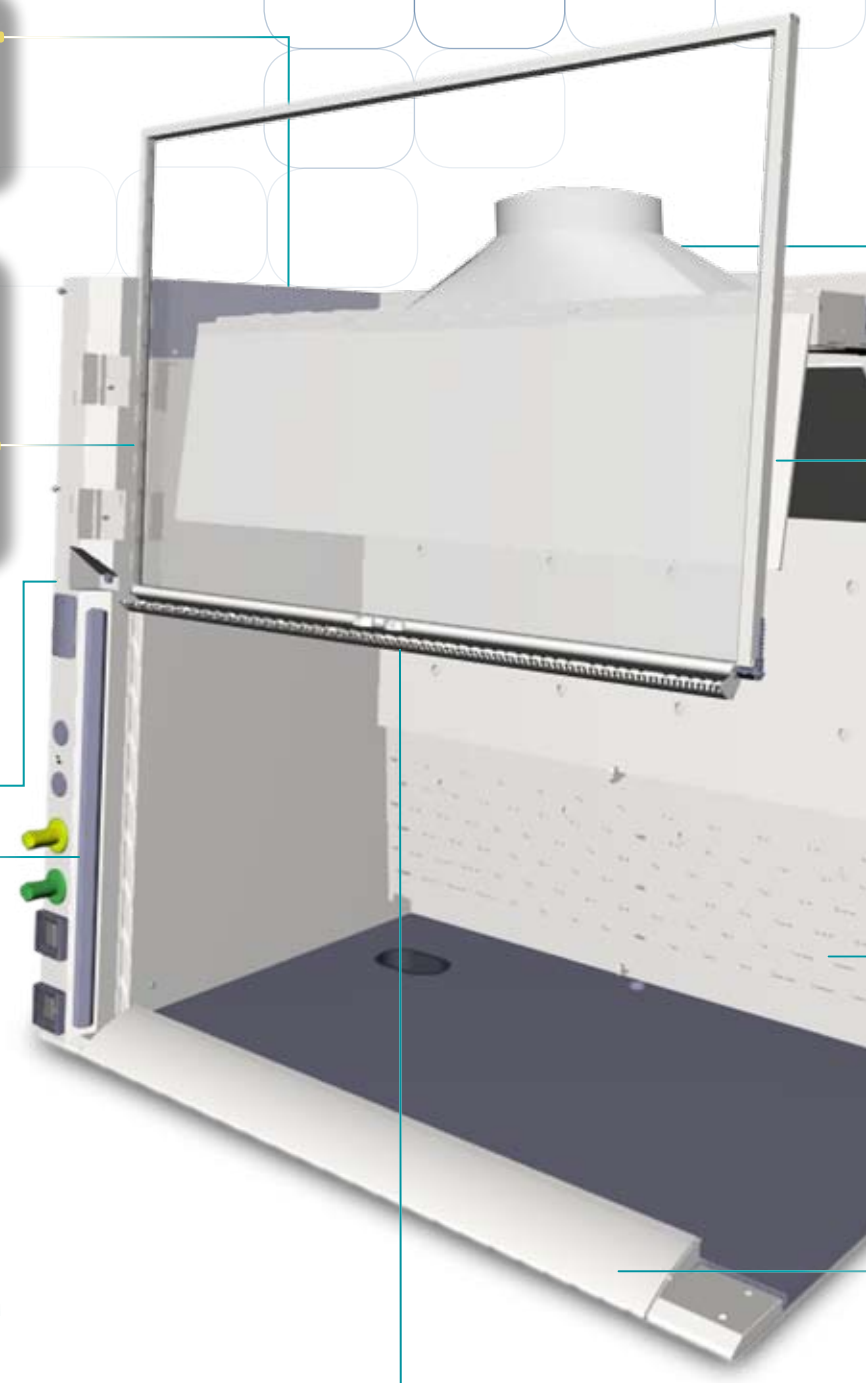
**Acela Shaping Vanes**

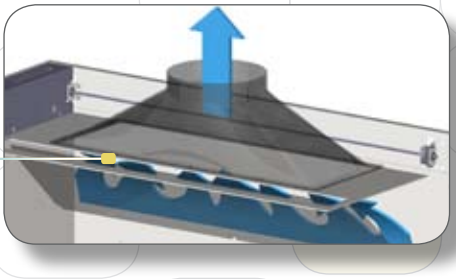
Increase airflow "sweep" at the critical area at the side walls to improve containment, especially when someone walks fast in front of the hood.



**Ergonomic Sash Handle**

Gently directs air into the hood without sacrificing visibility.



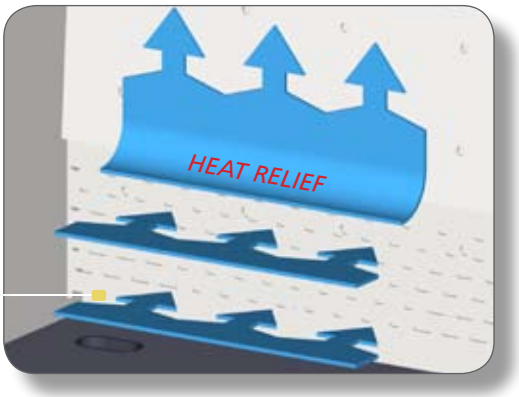


**Tapered Fiberglass Exhaust Collar**

Transitions exhaust air quietly and enhances airflow uniformity. (US patent 6,428,408)

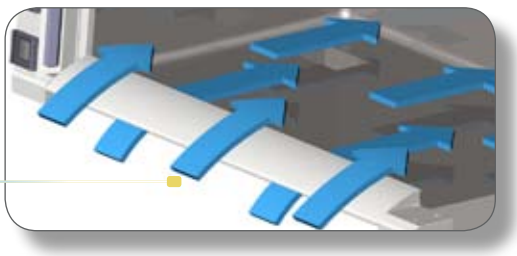
**Functionally Robust Bypass**

The unique design provides a robust stream of bypass air into the hood cavity.




**Hot Zone Baffles**

The unique Hot Zone Baffles draw most contaminants back in single pass displacement of the air. Thermal Heat Relief is quickly achieved. (US patent 6,428,408)



**Aerodynamic Foil Entry**

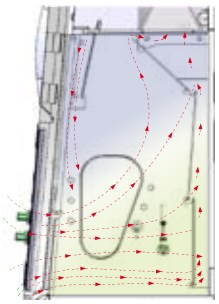
Provides maximum airflow "sweep" on the critical boundary layer near to the work surface level to reduce turbulence and eliminate backflow.

## Computational Fluid Dynamics

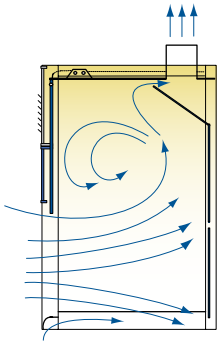
Computational Fluid Dynamics (CFD) modelling is employed in the development of Esco clean air and containment devices. Laminar Topography™ on Frontier Acela Fume Hoods was developed with computational fluid dynamics modelling in the Esco Research and Development Center. The main thrusts of the project were improved airflow uniformity, enhanced safety, reduction in noise levels, and energy consumption.

First, engineering teams conceptualized possible designs, and, instead of building physical models, utilized CFD to simulate airflow patterns, pressurizations and visualize possible areas of turbulence. This allowed a large number of iterations of the airfoil, sash handle, baffle, bypass and exhaust collar to be evaluated. Finally, physical prototypes were constructed, tested, and the best design combination selected for production.

CFD has allowed us to effectively reduce the vortex in conventional fume hood designs to the minimum, resulting in a safe yet energy-saving fume hood design.



*Frontier Acela High Performance Low Flow Fume Hood*



*Conventional Fume Hood*



| | Chemical Fume Containment | Electrical Safety |
|---|---|---|
| **Standards Compliance** | ANSI/ASHRAE 110-1995, USA<br>EN 14175, Europe | CAN/CSA-22.2, No.61010-1<br>EN-61010-1, Europe<br>IEC-61010-1, Worldwide |

## Safety Certified and Tested

All Esco fume hoods are manufactured for the most demanding laboratory applications.

- Independently tested and certified (4ft, 5ft and 6ft models) by Tintschl Engineering AG to the European Standard EN 14175-3.
- Independently tested and certified by Exposure Control Technologies, Inc. to the American Standard ASHRAE 110.
- Ergonomic design features combine to create a more comfortable work environment, which promotes safety by enabling the user to concentrate on his / her work.
- Hoods are ASHRAE tested on the production line on a sampling basis (industry exclusive).
- Sash is clearly labeled with all operating instructions and illustrations.



## Superstructure

- Tri-wall construction for maximum robustness.
- Fabricated of electro-galvanized steel (zinc coated to prevent rusting even if the powder coat is abraded, and phosphate for better adhesion of the powder coating).
- Epoxy-polyester hybrid Isocide™ antimicrobial powder coating provides long term chemical, abrasion and weathering resistance.
- The pan type design from a single piece of steel (unlike frame welded designs) is easier to assemble on site, and more robust for long-term usage.

## Aesthetics and Ergonomics Design

- Perfect Pitch Profile™. The gentle pitch of the hood enhances visibility and enables users to work further into the hood without strain.
- A tall sight line creates a bright, airy work space.
- Coordinated color scheme (neutral white with light grey accents) blends the hood with any casework, metal or wood.
- Color temperature is tuned to provide a gentle, bright (but not harsh) and comfortable work environment for the user.
- Ergonomic design on the Esco Frontier Acela™ is anthropometrically proven.
- Hood lighting is pre-wired. Lighting is electronically ballasted, energy efficient, instant start. Typical light intensity on work surface is >1076 lux (>100 foot candles) in zero ambient conditions.

## Additional Safety Features

- Sash stop limits sash movement beyond 457 mm (18.0”), ‘encouraging’ user to work at safe positions.
- When sash is raised above 457 mm (18.0”), it will automatically and gently fall back to the safe level (Esco's creep-down mechanism) unless held in place. This enables the sash to be raised temporarily to the full open position for set up of equipment and apparatus in hood, while enforcing regular operation of the hood with a lowered sash.

- Sash creep down can only be disabled with a key, which permits the laboratory manager or safety officer to restrict operation of the hood at sash openings above 457 mm (18.0”).
- The sash can also be locked down in the fully closed position with the key, in the event of a fume hood fault, facility shutdown, or, simply to restrict access to equipment set up in the hood.
- Fluorescent light casing is not secured, acting as an explosion relief, allowing upward pressure release during explosions, maximizing user safety.

## General Specifications, Frontier Acela Fume Hood

| Model | | | EFA-4UDR_W-_ | EFA-5UDR_W-_ | EFA-6UDR_W-_ | EFA-8UDR_W-_ |
|---|---|---|---|---|---|---|
| Nominal Size | | | 1.2 meters ( 4') | 1.5 meters ( 5') | 1.8 meters ( 6') | 2.4 meters ( 8') |
| External Dimensions (W x D x H) | | | 1220 x 900 x 1521 mm 48.0" x 35.4"x 59.9" | 1525 x 900 x 1521 mm 60.0" x 35.4"x 59.9" | 1830 x 900 x 1521 mm 72.0" x 35.4"x 59.9" | 2440 x 900 x 1521 mm 96.0" x 35.4"x 59.9" |
| Internal Dimensions * (W x D x H) | | | 996 x 672 x 1240 mm 39.2" x 26.5"x 48.8" | 1301 x 672 x 1240 mm 51.2" x 26.5"x 48.8" | 1606 x 672 x 1240 mm 63.2" x 26.5"x 48.8" | 2216 x 672 x 1240 mm 87.2" x 26.5"x 48.8" |
| Maximum Sash Opening | | | 740 mm (29.1") | | | |
| Exhaust Volume/ Static Pressure Required | Face Velocity | Sash Opening | | | | |
| | 0.3 m/s (60 fpm) | 457 mm (18.0") | 541 cmh @ 14.3 Pa 316 cfm @ 0.06" WG | 777 cmh @ 14.6 Pa 457 cfm @ 0.06" WG | 872 cmh @ 19.9 Pa 510 cfm @ 0.08" WG | 1203 cmh @ 14.2 Pa 708 cfm @ 0.06" WG |
| | 0.4 m/s (80 fpm) | 457 mm (18.0") | 721cmh @ 19.7 Pa 424 cfm @ 0.08" WG | 942 cmh @ 23.7 Pa 554 cfm @ 0.10" WG | 1163 cmh @ 28.8 Pa 684 cfm @ 0.12" WG | 1604 cmh @ 26.4 Pa 944 cfm @ 0.11" WG |
| | 0.5 m/s (100 fpm) | 457 mm (18.0") | 901 cmh @ 31.8 Pa 530 cfm @ 0.13" WG | 1177 cmh @ 34.7 Pa 692.8 cfm @ 0.14" WG | 1453 cmh @ 41.8 Pa 855 cfm @ 0.17" WG | 2005 cmh @ 32.3 Pa 1180 cfm @ 0.13" WG |
| | 0.3 m/s (60 fpm) | Full | 899 cmh @ 22.1 Pa 526 cfm @ 0.09" WG | 1175 cmh @ 28.7 Pa 691 cfm @ 0.12" WG | 1450 cmh @ 36.1Pa 848 cfm @ 0.15" WG | 1819 cmh @ 27.3 Pa 1070 cfm @ 0.11" WG |
| | 0.4 m/s (80 fpm) | Full | 1199 cmh @ 36.7 Pa 701 cfm @ 0.15" WG | 1556 cmh @ 49.3 Pa 922 cfm @ 0.20" WG | 1933 cmh @ 61.4 Pa 1138 cfm @ 0.25" WG | 2668 cmh @ 48.3 Pa 1570 cfm @ 0.19" WG |
| | 0.5 m/s (100 fpm) | Full | 1499 cmh @ 66.6 Pa 877 cfm @ 0.27" WG | 1958 cmh @ 76.6 Pa 1152 cfm @ 0.31" WG | 2197 cmh @ 94.7 Pa 1285 cfm @ 0.38" WG | 3335 cmh @ 74.3 Pa 1962 cfm @ 0.30" WG |
| Exhaust Outlet Diameter | | | 305 mm (12.0") | | | |
| Number of Exhaust Collars | | | 1 | 1 | 1 | 2 |

** When sash is in full open position, total height of fume hood is 1644mm/ 64.7".Please ensure sufficient ceiling height clearance is available.*

## Guide to Models

E F A - 4 U D R V W - 8

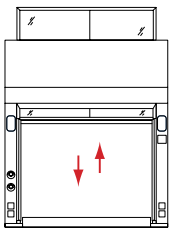
| External Width Code | | Internal Depth Code | | Internal Liner Code | | Sash Type | | Color Code | | Electrical Code | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 1220 mm (48.0") | **4U** | 900 mm (35.4") | **D** | Esco Resinate | **R** | Vertical | **V** | Esco White | **W** | 230V, AC, 50/60Hz | **8** |
| 1525 mm (60.0") | **5U** | | | | | Combination | **C** | | | 110-120V, AC, 50/60Hz | **9** |
| 1830 mm (72.0") | **6U** | | | | | | | | | | |
| 2440 mm (96.0") | **8U** | | | | | | | | | | |

### Serviceability

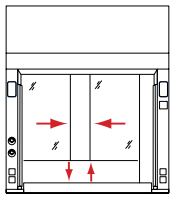
- Baffles remove to allow cleaning inside the hood.
- Internal access panels on side walls facilitate access to plumbing connections for service, especially when hoods are installed next to each other.
- Removable front panel facilitates easy access to lighting and other electrical components mounted above the hood work chamber.
- Chain and sprocket sash system requires minimal service.

### Warranty

The Frontier Acela High Performance Fume Hood is warranted for 1 year excluding consumable parts and accessories. Contact your local sales representative for specific warranty details.



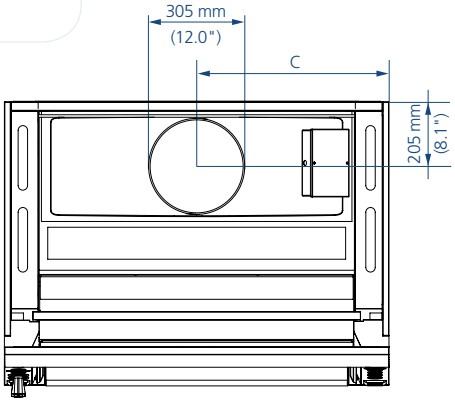
*Vertical sashes provide for full face opening.*



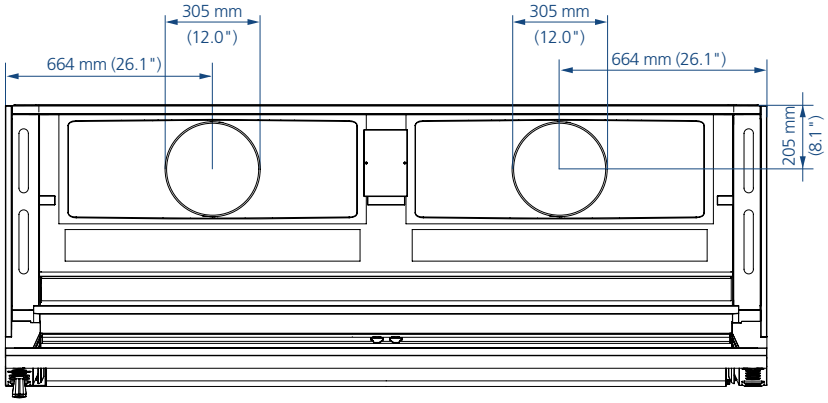
*Combination vertical and horizontal sashes enable full face opening for loading and set up, while allowing the operator to restrict the maximum opening of the face, but allow access to the top interior of the hood.*

## Model EFA, Frontier Acela Fume Hood Technical Specifications

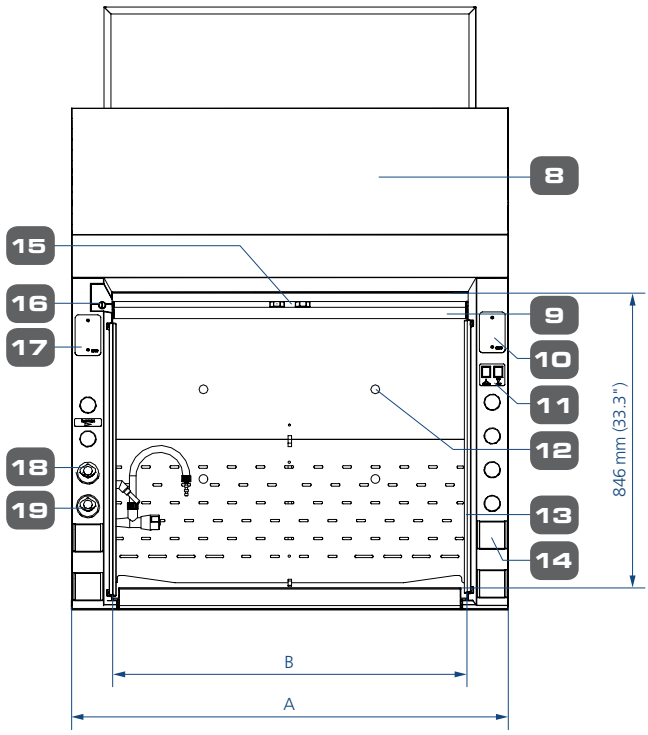
**Top View**
***(for EFA-4UDR_W-_, EFA-5UDR_W-_, EFA-6UDR_W-_)***



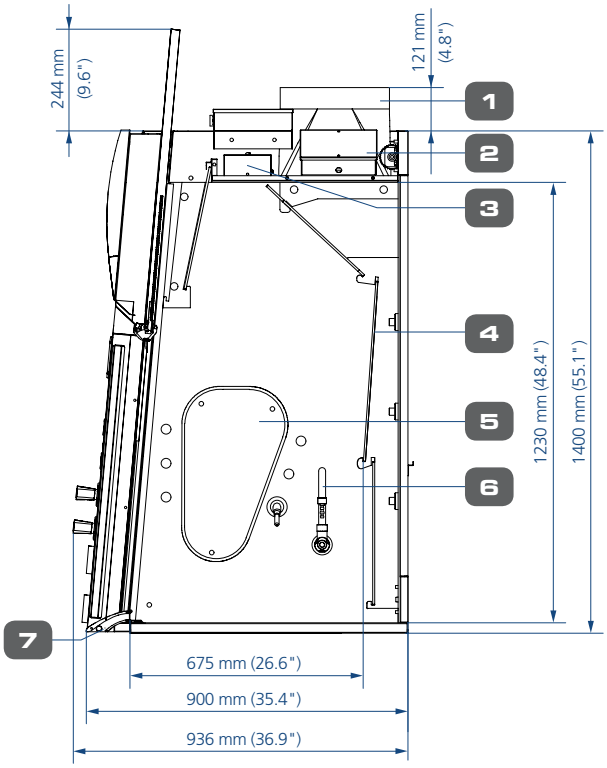

**Top View**
***(for EFA-8UDR_W-_)***




**Front View**




**Side View**




1. *Fiberglass exhaust collar*
2. *Electrical junction box*
3. *Light housing*
4. *Removable baffle*
5. *Side access panel*
6. *Swan-neck water faucet*
7. *Flash airfoil, hinged for cleaning, spillage containtment 0.4 Litres/0.1 gallons*
8. *Removable front panel*
9. *Tempered laminated framed sash glass*
10. *Provision for airflow alarm hinged airfoil*
11. *Light and fan switch*
12. *Distillation grid provision*
13. *Side vane*
14. *Electrical outlets*
15. *Sash stop*
16. *Sash keylock (lock sash at fully open and fully close)*
17. *Provision for additional outlets*
18. *Gas fixture remote*
19. *Cold water fixture remote*

**Fume Hood Dimensional Data**

| Model | A | B | C |
|---|---|---|---|
| EFA-4UDR_W-_ | 1220 mm (48.0") | 996 mm (39.0") | 610 mm (24.0") |
| EFA-5UDR_W-_ | 1525 mm (60.0") | 1301 mm (51.0") | 763 mm (30.0") |
| EFA-6UDR_W-_ | 1830 mm (72.0") | 1606 mm (63.0") | 915 mm (36.0") |
| EFA-8UDR_W-_ | 2440 mm (96.0") | 2216 mm (87.0") | 664 mm (26.0") |

**Fume Hood Installation Requirements**

- Proper location (refer to Esco recommendations)
- Exhaust system capable of delivering airflow and pressure drop requirements
  - Exhaust ductwork and connection accesories
  - Exhaust blower (or building exhaust system)
  - Contactor (if applicable)
  - Means of adjusting exhaust flow (damper or frequency inverter)
- Sufficient laboratory supply air
- Base cabinet or other means of support
- One set of filler panels for each continuous row of hoods
- Plumbing and electrical hook-up
- Unless otherwise specified, items and services specified above are not provided by Esco

## Options and Accessories

Esco offers a variety of options and accessories to meet application requirements.

- All Frontier Acela Fume Hoods include 1 water and 1 gas Enhanz™ remote-controlled fixture plumbed to the top of hood and 2 duplex outlets standard. (Specify outlet code when ordering)

### Electrical Outlets

Up to 4 duplex outlets per fume hood. (3 if airflow alarm kit installed.)

EO – D **A**

| Electrical Supply Code | Electrical Outlets | Electrical Supply Code | Electrical Outlets |
|---|---|---|---|
| A | | H | |
| C | | I | |
| D | | J | |
| E | | GFCI | |
| F | | UNI | |
| G | | | |

### Enhanz™ Service Fixtures

Remote control service fixtures for fume hoods, pre-plumbed. Up to 8 service fixtures per fume hood.

SFA – **E** **W**

**Style**
**E** : European

**Utility**
**W** : Water
**G** : Gas
**V** : Vacuum
**N** : Nitrogen
**O** : Oxygen
**C** : Compressed Air
**A** : Argon

### Sentinel•XL™ Airflow Alarm Kit

Real-time digital display of face velocity. Audible and visual alarms.

SXL – EFA

### Distillation Grids

Scaffoldings to support clamps for distillation apparatus.

DG – **4U** **S**

**External Width**
**4U** : 1220mm (48")
**5U** : 1525mm (60")
**6U** : 1830mm (72")
**8U** : 2440mm (96")

**Material**
**S** : Stainless steel

### Drip-Cups

**SPP** – DC

**Material**
**SPP** : Polypropylene
**SIC** : Ceramic,
*Only For Ceramic Work Tops*

### Work Tops

WT – **4U** **D** **R** – **0**

**External Depth**
**D** : 900 mm

**External Width**
**4U** : 1220mm (48")
**5U** : 1525mm (60")
**6U** : 1830mm (72")
**8U** : 2440mm (96")

**Material**
**R** : Trespa TopLab Plus
**E** : Epoxy
**C** : Ceramic
**4** : SS304
**6** : SS316

**Drip-Cup Cut-Out Position**
**0** :
**1** :
**2** :
**3** :

**Fume Hood Work Surface Selection**

*Esco offers 5 types of fume hood work surfaces for different applications*

| Type | SS304 | SS316 | Trespa TopLab Plus Phenolic Resin | Epoxy | Ceramic |
|---|---|---|---|---|---|
| Chemical Resistance | Good | Better | Better | Better | Best |
| Temperature Resistance | Better (300°C) | Better (300°C) | Good (110°C) | Good (165°C) | Best (1200°C) |
| Cost | Low Price | Mid Price | Mid Price | Mid Price | Premium |

## Frontier Acela Base Cabinetry (EBA)

### Safety Certified and Tested

- Built and tested according to SEFA-8 recommended practices.

### Superstructure

- Fabricated of electro-galvanized steel (zinc coated to prevent rusting even if the powder coat is abraded, and phosphated for better adhesion of the powder coating).
- Epoxy-polyester hybrid Isocide™ antimicrobial powder coating provides long term chemical, abrasion and weathering resistance.
- Ships unassembled, assembles rapidly on site.

### Aesthetics and Ergonomics Design

- Concealed door hinges.
- Soft-close insulated doors.
- Adjustable shelf allows user to select optimum heights for upper and lower storage compartments.

### Serviceability

- Convenient access to levelers from inside base cabinet.
- Removable rear access panel facilitates installation and maintenance of plumbing and drainage systems.

### Options and Accesories

- MCB/ELCB
  - Protects laboratory equipment during sudden fluctuation of current.
  - Fume hood circuit protection.
  - Only applicable to 230V, AC, 50/60Hz hoods.
  - Factory-installed; specify when ordering.
- Ventilation Kit (VK-EBA)
  - Ventilates base cabinet utilizing the hood exhaust system.
  - Field-installed.
- Filler Panel (FP-EBAD)
  - One set of filler panels required per continous row of hoods.
  - Field-installed



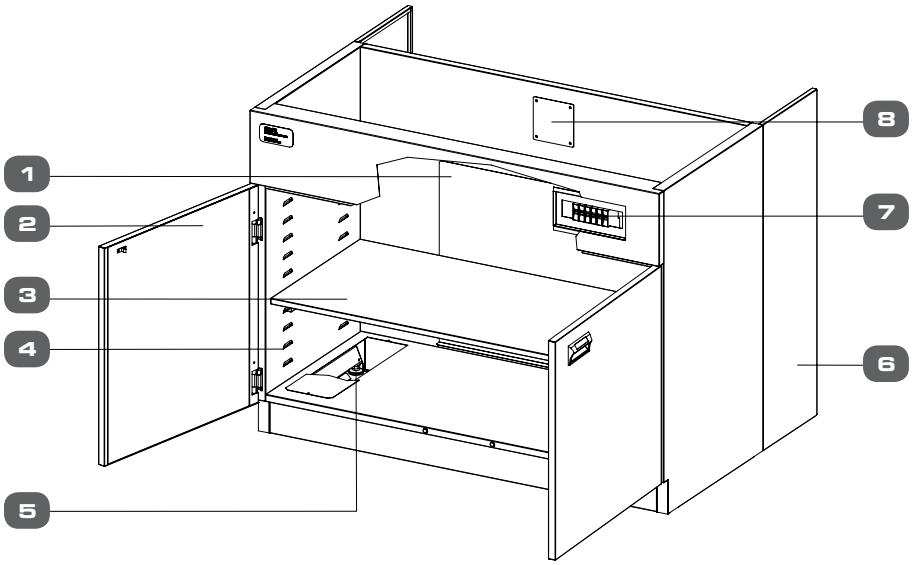
**SEFA-8 Test on Frontier Acela Base Cabinet (EBA)**

| No. | Type of Test | Test Result |
|---|---|---|
| 1 | Cabinet load test | PASS |
| 2 | Cabinet concentrated load test | PASS |
| 3 | Cabinet torsion | PASS |
| 4 | Cabinet submersion test | PASS |
| 5 | Door hinge test | PASS |
| 6 | Door impact test | PASS |
| 7 | Door cycle test | PASS |
| 8 | Chemical spot test | PASS |
| 9 | Hot water test | PASS |
| 10 | Impact test | PASS |
| 11 | Paint adhesion on steel | PASS |
| 12 | Paint hardness on steel | PASS |

*Door Hinge Test*

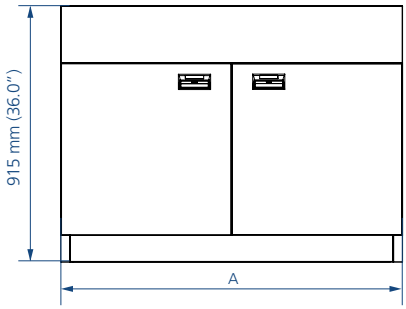
*Cabinet Load Test*

## Model EBA, Frontier Acela Base Cabinet Technical Specification

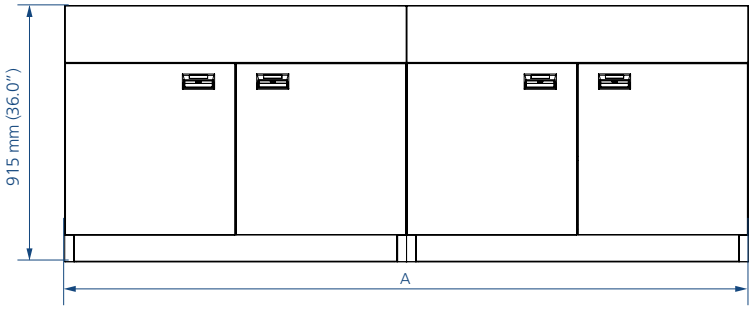



1. *Rear access panel*
2. *Soft close door*
3. *Adjustable shelf*
4. *Adjustable shelf slot*
5. *Base cabinet height leveler*
6. *Base cabinet filler panel (optional)*
7. *MCB/ELCB set (optional)*
8. *Ventilation provision*

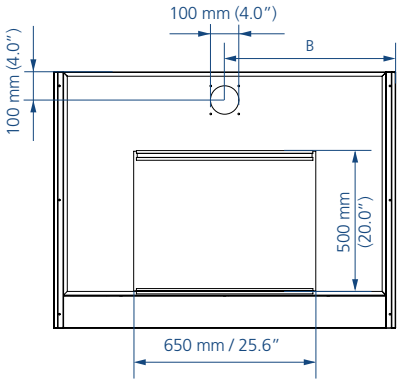
**Front View**
***EBA-4UDG-_ (for EFA-4UDR_W-_)***



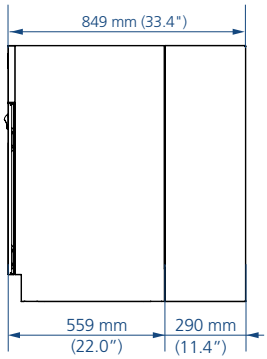

**Front View**
***EBA-5UDG-_/ EBA-6UDG-_/ EBA-8UDG-_***
***(for EFA-5UDR_W-_ , EFA-6UDR_W-_, EFA-8UDR_W-_)***




**Top View *(for All Sizes)***




**Side View *(for All Sizes)***




| Model* | A | B |
|---|---|---|
| EBA-4UDG-0 / EBA-4UDG-8 | 1220 mm (48.0") | 610 mm (24.0") |
| EBA-5UDG-0 / EBA-5UDG-8 | 1524 mm (60.0") | 381 mm (15.0") |
| EBA-6UDG-0 / EBA-6UDG-8 | 1830 mm (72.0") | 457.5 mm (18.0") |
| EBA-8UDG-0 / EBA-8UDG-8 | 2440 mm (96.0") | 381 mm (15.0") |

* *Model EBA-_____-0 is standard base cabinet without MCB/ELCB.*

*Model EBA-_____-8 is with MCB/ELCB protection and only applicable for 230V,AC,50/60Hz units. MCB/ELCB panel is always mounted on the top right hand corner of base cabinet set.*

## Esco Resinate

Esco Resinate™ is a proprietary composite material specifically designed for use as internal liner in laboratory fume hoods.

- Excellent chemical resistance (refer to table below)
- Excellent physical properties provide structural reinforcement for the hood
- Smooth, attractive, easy-to-clean finish

### Chemical Resistance* of Esco Resinate Internal Liner

| | Chemicals | Result |
|---|---|---|
| Acids | 85% Sulfuric Acid | No Effect |
| | 98% Sulfuric Acid | 1st Grade |
| | 50% Nitric Acid | 1st Grade |
| | 65% Nitric Acid | 2nd Grade |
| | 36% Hydrochloric Acid | No Effect |
| | 85% Phosphoric Acid | No Effect |
| | 40% Hydrofluoric Acid | No Effect |
| | 60% Chromic Trioxide | No Effect |
| | 99% Glacial Acetic Acid | No Effect |
| | Aqua Regia | No Effect |

| | Chemicals | Result |
|---|---|---|
| Solvents | 37% Fomaldehyde | No Effect |
| | N-Hexane | No Effect |
| | Ethyl Acetate | No Effect |
| | Ethyl Ether | No Effect |
| | Ethyl Alcohol | No Effect |
| | Isopropyl Alcohol | No Effect |
| | Carbon Tetrachloride | No Effect |
| | Naphthalene | No Effect |
| | Chloroform | No Effect |
| | Methanol | No Effect |
| | Toluene | No Effect |
| | Xylene | No Effect |
| | Acetone | No Effect |
| | Styrene | No Effect |
| | Phenol | No Effect |

| | Chemicals | Result |
|---|---|---|
| Alkalis | 40% Sodium Hydroxide | No Effect |
| | 65% KOH | No Effect |
| | 10% Iron Chloride | No Effect |
| | 10% Copper Sulfate | No Effect |
| | 15% Sodium Sulfide | No Effect |
| | Ammonium Hydroxide | No Effect |

| | Chemicals | Result |
|---|---|---|
| General Reagents | 50% Magnesium Sulfate | No Effect |
| | 34% Hydrogen Peroxide | No Effect |
| | Urea | No Effect |
| | Copper Sulfate | No Effect |
| | Karl Fisher Reagent | No Effect |
| | Iodine | No Effect |

| | Chemicals | Result |
|---|---|---|
| Stains and Indicators | 1%Gentian Violet | No Effect |
| | Methylene Blue | No Effect |
| | Crystal Violet | No Effect |
| | Methyl Red | No Effect |
| | Methyl Orange | No Effect |

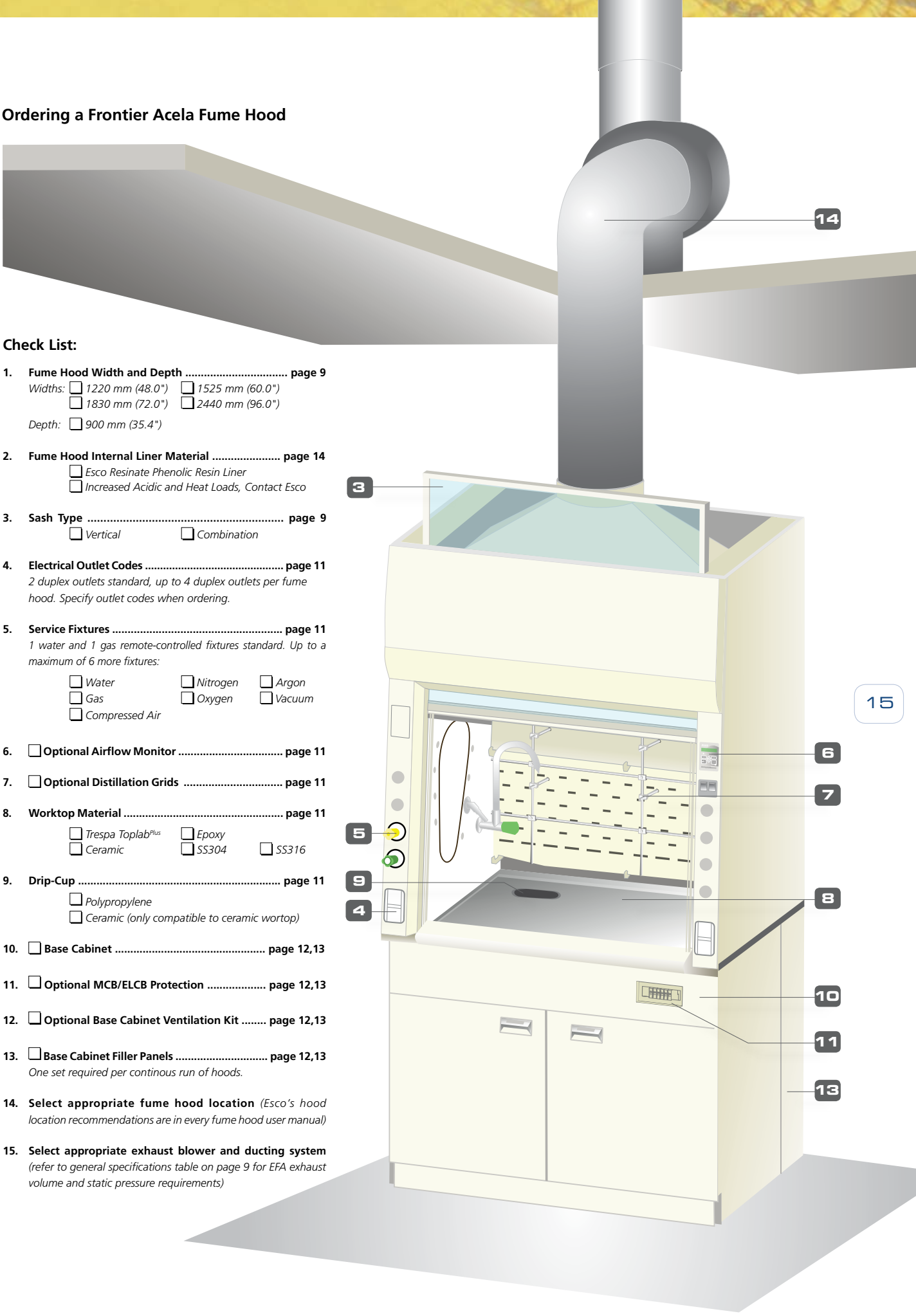
*Note: Esco Resinate may not be suitable for fume hoods for increased acidic and heat loads. Contact your local sales representative for details.*

** Test Method: One drop of test chemical placed on material surface and covered with watch glass for 16 hours before result is observed.*

*- 1st Grade: Slight effect on color and gloss. No change to physical properties.*

*- 2nd Grade: Clear effect on color and gloss. No change to physical properties.*

## Ordering a Frontier Acela Fume Hood




### Check List:

1. **Fume Hood Width and Depth** ..... **page 9**
   *Widths:* ☐ *1220 mm (48.0")* ☐ *1525 mm (60.0")* ☐ *1830 mm (72.0")* ☐ *2440 mm (96.0")*
   *Depth:* ☐ *900 mm (35.4")*

2. **Fume Hood Internal Liner Material** ..... **page 14**
   ☐ *Esco Resinate Phenolic Resin Liner*
   ☐ *Increased Acidic and Heat Loads, Contact Esco*

3. **Sash Type** ..... **page 9**
   ☐ *Vertical* ☐ *Combination*

4. **Electrical Outlet Codes** ..... **page 11**
   *2 duplex outlets standard, up to 4 duplex outlets per fume hood. Specify outlet codes when ordering.*

5. **Service Fixtures** ..... **page 11**
   *1 water and 1 gas remote-controlled fixtures standard. Up to a maximum of 6 more fixtures:*
   ☐ *Water* ☐ *Nitrogen* ☐ *Argon*
   ☐ *Gas* ☐ *Oxygen* ☐ *Vacuum*
   ☐ *Compressed Air*

6. ☐ **Optional Airflow Monitor** ..... **page 11**

7. ☐ **Optional Distillation Grids** ..... **page 11**

8. **Worktop Material** ..... **page 11**
   ☐ *Trespa Toplab*[Plus] ☐ *Epoxy*
   ☐ *Ceramic* ☐ *SS304* ☐ *SS316*

9. **Drip-Cup** ..... **page 11**
   ☐ *Polypropylene*
   ☐ *Ceramic (only compatible to ceramic wortop)*

10. ☐ **Base Cabinet** ..... **page 12,13**

11. ☐ **Optional MCB/ELCB Protection** ..... **page 12,13**

12. ☐ **Optional Base Cabinet Ventilation Kit** ..... **page 12,13**

13. ☐ **Base Cabinet Filler Panels** ..... **page 12,13**
    *One set required per continous run of hoods.*

14. **Select appropriate fume hood location** *(Esco's hood location recommendations are in every fume hood user manual)*

15. **Select appropriate exhaust blower and ducting system** *(refer to general specifications table on page 9 for EFA exhaust volume and static pressure requirements)*

Biological Safety Products
Cleanroom Products
Containment / Pharma Products
Ductless Fume Hoods / Carbon Filtration
General Purpose Scientific Equipment
Industrial Lab Equipment
In-Vitro Fertilization Products
PCR Products
Pharmacy Products
Lab Animal Research Products
Lab Thermostatics Products
Lab Ventilation / Chemical Fume Products / Lab Furniture
Powder Handling Products

*Since 1978, Esco has emerged as a leader in the development of controlled environment, laboratory and cleanroom equipment solutions. Products sold in more than 100 countries include biological safety cabinets, cleanroom products, compounding pharmacy equipment, containment / pharma products, ductless fume hoods, in vitro fertilization workstations, lab animal research products, laboratory fume hoods, laboratory ovens and incubators, laminar flow clean benches and PCR products and instrumentation. With the most extensive product line in the industry, Esco has passed more tests, in more languages, for more certifications, throughout more countries than any biosafety cabinet manufacturer in the world. Esco remains dedicated to delivering innovative solutions for the clinical, life science, research and industrial laboratory community. www.escoglobal.com.*

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SEFA

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